

INS C19

CLAIMS

1. Machine for diagnostic and/or therapeutic treatment, particularly a Nuclear Magnetic Resonance Imaging machine, comprising, in combination therewith, a table (2) for supporting the patient which table is engageable and disengageable from part of the structure of the machine (1), characterized in that the table (2, 102, 202) is provided with at least one peripheral recess (302) in its surface or in a part thereof which recess is complemented by a side (201) of the operating surface forming part of the structure of the machine (1), particularly of the delimitation walls of the cavity or chamber for accommodating the patient.

2. A Machine as claimed in claim 1, characterized in that each recess (302) of the table is associated to an insert (502) for complementing the supporting surface, which is removable.

3. A machine as claimed in claim 1 or 2, characterized in that said recesses (302) of the table have a much smaller size than the overall supporting surface of the table (2) and that they form open spaces in said supporting plane, such that they can be covered by the patient body without affecting the support thereof.

4. A machine as claimed in one or more of the preceding claims, characterized in that the table (2, 102) has a plurality of these recesses (302), particularly at least two or three recesses (302)

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arranged in the area of the upper limbs and shoulder, in the area of the neck and head, and in the area of the lower limbs, such as the knee, the foot or similar, i.e. in the end areas of the table.

5        5. A machine as claimed in one or more of the preceding claims, characterized in that at least one recess is provided in the trunk area of the table (2, 102, 202).

10       6. A machine as claimed in one or more of the preceding claims, characterized in that there are provided means for coupling the complementary inserts (502) which are preferably of the sliding type and are provided partly on said inserts (502), and partly at the delimiting edges of recesses (302) of the table (2, 15    102, 202).

20       7. A machine as claimed in one or more of the preceding claims, characterized in that, in order to provide adaptability to several different sizes of different operating or work surfaces (201), inserts (502) can be coupled to each other and to the recess of the table like modular elements, and modules have different shapes, so as to allow them to fit the different possible shapes of the operating surfaces (201).

25       8. A machine as claimed in one or more of the preceding claims, characterized in that the table (2) is transversely divided into two parts (102, 202), preferably in an approximately median area, which parts complement each other in jointed coupling.

30       9. A machine as claimed in one or more of the

preceding claims, characterized in that a part of the table (102) is provided, at its periphery, on the side connecting to the other part (202) with means (5) for angularly displacing the second part (202) with respect of the first part (102) by maintaining the supporting surfaces of both parts substantially parallel one with respect to the other.

10. A machine according to claim 9, characterised in that a part of the table (102) has a recess (302) whose median axis is oriented coaxially to the central longitudinal axis of the table (2), which recess (302) has its open side at the end side of the part of the table (102) wherein it is provided, which is opposite to the side connected to the other part (202) of the table.

11. A machine as claimed in one or more of the preceding claims, characterized in that the part (102) of the table (2), whereto the guide (5) is associated has at least one recess (302) at the end side opposite to the one connecting to the other part (202) of the table (2) and substantially consists of a U-shaped frame, whereas the arched guide (5) for jointing it to the other part (202) of the table (2) is attached all around said U-shaped frame, extending from one end to the other of the end side of said part (102) of the table, said end side being opposite to the end connected to the other part of the table.

12. A table as claimed in one or more of the preceding claims, characterized in that the recess

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(302) has a U shape, whereas the first (102) of the table have a circular outside perimeter, coaxial to the arched jointing guide (5) and the second part (202) of the table has a circularly arched surface at the end facing the first part.

13. A machine as claimed in one or more of the preceding claims, characterized in that the two parts of the table (102, 202) have two legs each (3), disposed so that the table (2) can be self-supporting, whereas each part (102, 202) cannot be self-supporting in the work position, without the other.

14. A table as claimed in one or more of the preceding claims, characterized in that each part (102, 202) of the table may have such a number of legs (3) as to enable a self-support thereof, when separated from the other part, whereas the legs (3) may be wheeled (4) or not.

15. A table as claimed in one or more of the preceding claims, characterized in that the structure of the table (2) and the arrangement of the legs (3) is such that the table may be used as a conventional transport table.

16. A machine as claimed in one or more of the preceding claims, characterized in that the table (2) or at least the part (102) of the table which can be directly coupled to the operating surface of the machine and more precisely to the magnet part (1), can be removed and separated therefrom.

17. A machine as claimed in one or more of the

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preceding claims, characterized in that it is a Nuclear  
Magnetic Resonance Imaging machine having a C-shaped  
magnet, i.e. whose cavity may be accessed from three  
sides of its perimeter, and in which the lower  
5 horizontal side (201) delimiting the cavity is the part  
designed to complement the recess (302) of the table  
(2).

18. A machine as claimed in one or more of the  
preceding claims, characterized in that the magnet (1)  
10 consists of two horizontal plates, separated by two or  
three columns, and has such means for coupling the  
table (2) and the side (201) has such a shape, as to  
allow the table to be coupled and the supporting  
surface of the table (2) to be complemented by  
15 insertion of said side (201) into the recess (302) of  
the table in at least two different directions.

19. A machine in particular a Nuclear Magnetic  
Resonance Imaging machine having a working side or  
surface (201) delimiting the cavity for the patient and  
20 having means for securing on it a receiving coil (30,  
31), characterized in that the coil (30, 31) can be  
fixed in one or more predetermined positions inside the  
cavity of the magnet (1), and can be rotated about an  
axis perpendicular to the side or surface (201).

25 20. A machine in particular a Nuclear Magnetic  
Resonance Imaging machine according to one or more of  
the preceding claims characterized in that the table  
(2) is composed of two parts (102, 202), that may be  
oriented in different relative angular positions on the

horizontal plane, while the coil (30, 31) can be fixed in one or more predetermined positions inside the cavity of the magnet (1), and can be rotated about an axis parallel to the angular displacement angle covered by one part (202) of the table (2) with respect to the other part (102).

21. A machine as claimed in claim 19 or 20, characterized in that the base (31) of the receiving coil (30) has removable means (32, 33, 34, 35, 36, 37, 38) for locking the receiving coil in any angular position.

22. A machine as claimed in claim 21, characterized in that the receiving coil (30) has a fastening coil (31) comprising a stationary part (32) for anchoring it to the corresponding side (201) of the magnet cavity and a part (31) which is rotatable with respect to the anchoring one and is integral with the receiving coil (30).

23. A machine as claimed in claim 22, characterized in that rotating contacts can be integrated in the rotatable base (31, 32), for simultaneous electric connection of the receiving coil (30) to the machine or, an electric connection cable outside the coil (30) is provided, having a connector whereto one or more plugs, also outside the base (31) of the receiving coil (30) can be plugged.

24. A machine as claimed in one or more of the preceding claims 20 to 23, characterized in that the locking means consist of radial wedge-shaped cursors

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(33), which can be moved radially into a retracted and an extracted position with respect to a stationary housing (32), and interact with a set of wedging recesses or with an annular wedging throat (131) in the rotatable base (31) in a surface facing towards said wedging cursors (33).

25. A machine as claimed in one or more of the preceding claims 20 to 24, characterized in that it has a stationary abutment surface (201), facing towards a stop surface for the base (31) of the coil, there being provided means for clamping said stop surface against the abutment surface (201), which can be operated at the same time as the removable means for locking in position the receiving coil (30).

26. A machine as claimed in claim 25, characterized in that said clamping means consist of wedge-shaped cursors (33), which have a face opposite to the abutment surface and parallel to said abutment surface (201), whereas the face turned towards said abutment surface is inclined towards it from the free side for wedging the wedge-shaped cursors (33).

27. A Nuclear Magnetic Resonance Imaging machine having at least two plane surfaces delimiting the cavity for the patient characterized in that the magnet (1) has at least one or more rigid shielding members (41) for at least partially closing at least one of the open sides, which can be moved between a position for opening and a position for at least partially closing at least one side, said member/s being made of an

electrically conducting material or anyway coated with layers made of an electrically conducting material.

28. A machine as claimed in claim 27 or in one or more of the preceding claims, characterized in that the  
5 shielding member (41) is preferably hinged about an axis so as to oscillate into said two positions, there being provided, on at least one side thereof, electric contacts interacting with other electric contacts arranged on a stationary abutment on the magnet and/or  
10 on the part (102) of the table associated to the side (201) thereof.

29. A machine as claimed in claims 27 or 28, characterized in that it has a U-shaped magnet, wherein the shield (41) is intended to close completely or at  
15 least partly the side which is substantially opposite to the vertical closed branch (301) of the magnet structure (1), while leaving both lateral apertures of the perimeter, transverse to said closed branch (301) of the magnet structure, at least partly open.

20 30. A machine as claimed in claims 27 or 28, characterized in that it has a magnet configuration (1) having two opposite poles (101, 201), only connected to each other by a small extension of the perimeter or in several small areas, e.g. by means of uprights, such as  
25 columns or the like, whereas more than one of such shielding members are provided (41), which have such angular extensions as to complement each other in covering the whole perimeter, either contacting each other, both mechanically and electrically, in the



closing condition or not.

31. A machine as claimed in one or more of the preceding claims 27 to 30, characterized in that in the areas in which said members do not contact each other mechanically and electrically, e.g. at the passages for the patient body, flexible shielding members are provided, such as cushions, curtains, sleeves, or else, which are electrically conductive and connected both mechanically and electrically to the rigid covering members, and which delimit the open area, and to the patient body and/or to the table or to electrically conducting fastening members provided on the table (2).

32. A machine as claimed in one or more of the preceding claims 27 to 31, characterized in that the sides that the shielding member (41) leaves at least partially open can be closed by rigid or flexible shielding members, which can be mechanically removably fastened to the parts which delimit the aperture and can be electrically removably connected to the parts which delimit the aperture.

33. A machine as claimed in one or more of the preceding claims 27 to 32, characterized in that the magnet (1) is of the C-shaped type and the rigid shielding member (41) has a U-shaped frame (141), with the free ends of the U branches being fastened to the opposite ends of an oscillation axis which is perpendicular to the open sides of the magnet structure (1) and transverse to the closed vertical side (301) of the magnet (1) connecting the two sides (101, 201)

associated to the poles.

34. A machine as claimed in one or more of the preceding claims, characterized in that the U-shaped frame (141) has, in the part which is substantially diametrically opposite to the hinging axis, an extension (241) which is designed to close the open side of the magnet, opposite to said vertical closed side (301) and extends until it abuts on the side (201) of the cavity of the magnet (1), associated to the table (2), which is complemented by said side (201), there being provided means for electric connection between the shield (41) and said stop part (201, 102).

35. A machine as claimed in claim 34, characterized in that the extension (241) of the shield (41) can also extend partly on the two opposite sides parallel to the branches of the oscillating U-shaped supporting frame (141)

36. A machine as claimed in one or more of the preceding claims, characterized in that the hinging axis is at the same level as one of the two opposite sides (101) of the magnet (1) associated to one of the poles and preferably, but not necessarily, of the upper horizontal side (101).

37. A machine as claimed in one or more of the preceding claims, characterized in that means for electric connection between an electrically conductive case of the magnet (1) and the rigid shielding member (41) may be also provided along the U-shaped oscillating frame.

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38. A machine as claimed in one or more of the preceding claims, characterized in that it is a Nuclear Magnetic Resonance Imaging machine having a C-shaped magnet, or a magnet composed of two opposite horizontal plates connected by columns, preferably two columns, at a small distance from each other, and mounted on a cart, whereas the lower horizontal side (201) delimiting the cavity of the magnet (1) is designed to complement a recess (302) of a table (2), said side (201) of the magnet (1) having a smaller surface than the table (2), preferably both in width and in length and anyway such a surface that a housing recess of said side (201) may be covered by the patient body without affecting the support thereof by the table.

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